

REMARKS

Claims 1-23 were pending. Claims 1-16, 22, and 23 which were withdrawn from consideration have been canceled without prejudice or disclaimer. Claims 17-19 and 21 have been amended. New claims 24-28 have been added. Reexamination and reconsideration of the present application is respectfully requested.

At the outset, the Examiner is thanked for the thorough review and consideration of the present application. The Examiner's Office Action dated June 9, 2003 has been received and the contents carefully noted.

Applicants confirm the election without traverse of claims 1-16, 22, and 23.

The specification has been amended to correct minor informalities. No new matter has been added.

In the Office Action, the Examiner objected to claim 18 as being dependent upon a rejected base claim, but as being allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Applicants thank the Examiner for the indication of allowable subject matter. However, for reasons that will now be discussed, claim 18 is allowable in its present dependent form.

The Examiner rejected claims 17 and 19-21 under 35 USC 102(e) as being anticipated by Vodakov et al. (US Patent No. 6,508,880). This rejection is respectfully traversed.

Claim 17, as amended, is allowable at least for the reason that claim 17 recites a combination of features including, for example,

“...wherein the supporting part supports the silicon carbide single crystal substrate at a periphery of a back surface of the silicon carbide single crystal substrate such that a an entire front surface of the silicon carbide single crystal

substrate faces the source material to grow the silicon carbide single crystal on a front surface." [emphasis added]

Claim 20 is allowable at least for the reason that claim 20 recites a combination of features including, for example,

"...the protection layer is exposed to an outside space."

Claim 21, as amended, is allowable at least for the reason that claim 21 recites a combination of features including, for example,

"...a front surface of the silicon carbide single crystal substrate has a supported face supported by a supporting part and disposed at a periphery of the front surface; and a growth face disposed on a center of the front surface and projecting toward a source material, the growth face for growing the silicon carbide single crystal." [emphasis added]

None of the cited references teaches or suggests each and every element of the claims.

The apparatus and substrate for producing silicon carbide of the present invention supports the seed crystal during growth so as not to damage a protection layer on the back surface of the seed crystal. Alternatively, an adhesive is provided on the periphery of the seed crystal for support. *See* page 3 of the specification of this application.

Vodakov et al. discloses an apparatus for growing low defect density silicon carbide. A seed crystal 501 is held within a portion of ring element 503. A graphite foil ring 505 is interposed between ring element 503 and the growth surface of crystal 501 to sealing the seed crystal to the ring element. The side and back surfaces of crystal 501 are covered with a graphite foil 507. A graphite disk 509 is coupled to seed crystal 501 via graphite foil 507. The primary purpose of disk 509 and interposed graphite foil 507 is to

aid in the removal of heat from crystal 501. Additionally, disk 509 provides a support surface for crystal 501 as well as a means for conveniently applying pressure to the crystal with graphite ring 511, thereby achieving a seal between the crystal and element 503. *See* column 9, lines 6 to 22 and Fig. 5. Further, diameter D, the largest inner diameter of element 503, is 30 millimeters although there are no major limitations to increasing this diameter, thereby yielding a larger grown crystal. Diameter d, the smallest inner diameter of element 503 is selected such that the ratio D/d is greater than 3. *Id.* at lines 30-38.

The reference fails to disclose the features recited in claim 17, namely, a supporting part supporting the silicon carbide single crystal substrate at a periphery thereof such that a whole front surface of the silicon carbide single crystal substrate faces the source material to grow the silicon carbide single crystal on a front surface. In the present invention, an entire front surface of the silicon carbide single crystal substrate is a growth face such that a silicon carbide single crystal having a large diameter and high quality can be efficiently produced. *See* specification at page 10, lines 2-7, page 10, paragraph beginning on line 23, page 11, lines 9-20, page 11, paragraph beginning on line 27, page 12, lines 20-27, and page 13, paragraph beginning on line 21.

Vodakov et al. only discloses a graphite foil ring 505 on the growth surface of crystal 501 to seal the seed crystal to the ring element 503. Therefore, the whole front surface is not a growth face as recited in claim 17 since the ring 505 is provided on the growth surface.

In addition Vodakov et al. fails to disclose the features recited in claim 20, namely, a protection layer exposed to an outside space. The protection layer is exposed to

an outside space so that the temperature of the back surface of the SiC seed crystal 3 having the carbon layer can be monitored by a radiation thermometer 12 in the present invention. Rather, in Vodakov et al. a graphite disk 509 is disposed on the graphite foil 507 which covers the back surface of the crystal 501. Therefore, the graphite foil 507 is not exposed to an outside space as recited in claim 20 and the temperature of the foil 507 cannot be efficiently monitored.

Further, Vodakov et al. fails to disclose the features recited in claim 21, namely, a front surface of the silicon carbide single crystal substrate supported by a supporting part and disposed at a periphery of the front surface; and a growth face disposed on a center of the front surface and projecting toward a source material for growing the silicon carbide single crystal. The SiC single crystal 4 is not prevented from growing on the growth face 3b projecting toward the SiC source material 2 side in the present invention.

However, in Vodakov et al., the front surface of the crystal 501 is supported by graphite foil 505 and if there is a growth face, it does not project toward a source material, and the foil 505 on the supported face prevents the crystal from growing on part of the growth surface.

It can thus be understood that the reference does not in any way anticipate the essential features of the present invention as set out in independent claim 17, 20, and 21.

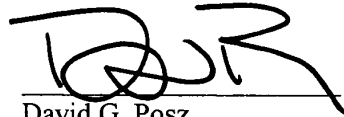
Moreover, as claim 19 depends from independent claim 17, this claim is also allowable for the same reasons as its respective base claim.

As the cited reference fails to anticipate the present invention as recited in claims 17 and 19-21, Applicants respectfully request that the rejection of claims 17 and 19-21 under 35 USC 102(e) be withdrawn.

Newly added independent claim 24 recites the features of original claim 17 and allowable claim 18. Newly added dependent claim 25 further limits independent claim 17 by reciting further features regarding a gap between the protection layer and the inner wall of the container. Newly added dependent claim 26 further limits claim 17 by reciting further features regarding the supporting part. Newly added dependent claim 27 further limits claim 20 by reciting further features regarding the protection layer. Newly added dependent claims 28 further limits claim 21 by reciting further features regarding the growth face. Applicants respectfully submit that new claims 24-28 are allowable over the cited references.

In view of the above remarks, the present application is believed to be in condition for allowance. A prompt notice to that effect is respectfully requested. A one-month extension and the requisite fee are included with this Amendment. Although no additional fees are believed to be due, permission is hereby given to charge any unforeseen fees to deposit account 50-1147.

Respectfully submitted,



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